Claims

1. A laser machining apparatus comprising:

a workpiece fixture (10) for fastening a workpiece (1), and

a first laser removing device (11) for machining a workpiece using first operating parameters,

characterized by

a second laser removing device (12) which can machine a workpiece using second operating parameters that are different from the first operating parameters, especially regarding the quality and/or quantity.

2. The laser machining apparatus according to claim 1, characterized in that the first laser removing device comprises a first laser source (13) and the second laser removing device comprises a second laser source (14).

3. The laser machining apparatus according to claim 1 or 2, characterized in that at least one of the laser removing devices comprises a beam guide (17), preferably through one or more deflection mirrors.

4. The laser machining apparatus according to one or more of the preceding claims, characterized by mechanical adjustment axes (2) by means of which the workpiece can be adjusted translatorily with respect to a machine frame, the laser beam outlets of the two laser removing devices being fixed mounted in a manner offset against each other relative to at least one,

preferably, two axes, more preferably relative to the two horizontal axes (x, y).

5. The laser machining apparatus according to one or more of the preceding claims, characterized in that the laser beam outlet of one or both laser removing devices is slidable with respect to at least one axis, preferably the vertical axis (z).

6. The laser machining apparatus according to claim 5, characterized in that the laser source is slidable in parallel and in sync to the laser beam outlet.

7. The laser machining apparatus according to one or more of the preceding claims, characterized by a first control (8) for controlling the first laser removing device and a second control (9) for controlling the second laser removing device.

8. The laser machining apparatus according to claim 7, characterized in that the second control operates at a higher clock frequency than the first control.

9. The laser machining apparatus according to claim 7 or 8, characterized by an interface (7) between the first and second controls.

10. The laser machining apparatus according to one or more of the preceding claims, characterized in that the first laser removing device comprises a first optical system and the second laser removing device comprises a second optical system.

11. The laser machining apparatus according to one or more of the preceding claims, characterized in that the first laser removing

device comprises a first sensor system and the second laser removing device comprises a second sensor system.

12. The laser machining apparatus according to one or more of the preceding claims, characterized in that the first laser removing device is a laser drilling device and that the second laser removing device is a device for die production.

13. The laser machining apparatus according to one or more of the preceding claims, characterized in that the first laser removing device may comprise one or more of the following operating parameters:

- pulsed laser light, in particular a laser pulse frequency of 0.1 to 100 Hz, preferably 1 – 30 Hz,
- a laser pulse duration of 0.1 to 20 ms, preferably 0.3 to 2 ms,
- pulse peak performance > 1 kW, preferably > 20 kW,
- laser performance 300 W – 3 kW
- energy per pulse 1 – 100 J, preferably 10 – 50 J,
- laser type: solid-state laser, in particular diode-pumped or lamp-pumped,

and that the second laser removing device may comprise one or more of the following operating parameters:

- pulsed laser light, in particular a laser pulse frequency of 1 to 100 kHz, preferably 10 – 50 kHz,

- a laser pulse duration of 10 to 1500 ns, preferably 100 to 500 ns,

- laser performance 10 – 200 W, preferably 20 - 50 W,

- energy per pulse 1 – 50 mJ,

- laser type: quality-switched solid-state laser.

14. A laser machining method wherein a workpiece is clamped and then machined using laser light,

characterized in that

without changing the clamping a first machining step is performed through a first laser removing device using first operating parameters and a second machining step is performed through a second laser removing device to machine the workpiece using second operating parameters different from the first operating parameters, especially regarding the quality and/or quantity.

15. The method according to claim 14, characterized in that the first machining step is the performance of a bore using a laser and the second machining step is the production of a die using a laser.

16. The method according to claim 15, characterized in that a measurement of the distance necessary for the second

machining step is performed before the first machining step is taken.

17. The method according to one or more of claims 14 to 16, characterized in that during the first machining step using the first laser removing device the focusing of the laser beam is fixed whereas during the second machining step using the second laser removing device the focusing of the laser beam is tracked.

18. The method according to one or more of claims 14 to 17, characterized in that during the first machining step using the first laser removing device process gas is supplied.

19. The method according to one or more of claims 14 to 18, characterized in that during the second machining step using the second laser removing device the location of the laser beam is guided by a variable beam guide.

20. The method according to one or more of claims 14 to 19, characterized in that during the first machining step using the first laser removing device the relative position of the location of the first laser removing device to the workpiece is changed.

21. The method according to one or more of claims 14 to 20, characterized in that first the machining step having a higher laser performance is taken and then the machining step having a lower laser performance is taken.